

Kennedy Space Center Spaceport Analysis

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Until the Shuttle Atlantis' final landing on July 21, 2011, Kennedy Space Center (KSC) served as NASA's main spaceport, which is a launch and landing facility for rockets and spacecraft that are attempting to enter orbit. Many of the facilities at KSC were created to assist the Shuttle Program. One of the most important and used facilities is the Shuttle Landing Facility (SLF). This was the main landing area for the return of the shuttle after her mission in space. However, the SLF has also been used for a number of other projects including straight-line testing by Gibbs Racing, weather data collection by NOAA, and an airfield for the KSC helicopters. This runway is three miles long with control tower at midfield and a fire department located at the end in care of an emergency. This facility, which was part of the great space race, will continue to be used for historical events as Kennedy begins to commercialize its facilities. KSC continues to be an important spaceport to the government, and it will transform into an important spaceport for the commercial industry as well.

During my internship at KSC's Center Planning and Development Directorate, I had the opportunity to be a part of the negotiation team working on the agreement for Space Florida to control the Shuttle Landing Facility. This gave me the opportunity to learn about all the changes that are occurring here at Kennedy Space Center. Through various meetings, I discovered the Master Plan and its focus is to transform the existing facilities that were primarily used for the Shuttle Program, to support government operations and commercial flights in the future. This idea is also in a new strategic business plan and completion of a space industry market analysis. All of these different documentations were brought to my attention and I saw how they came together in the discussions of transitioning the SLF to a commercial operator, Space Florida. After attending meetings and partaking in discussions for the SLF Agreement, I formed the idea of a Spaceport Analysis as my over internship project.

As previously stated, I had the opportunity to sit in on the market analysis meetings and read through the analysis itself. I suggested the creation of a SWOT analysis, which allows an individual to see an overview of the company's strengths and weaknesses alongside any industry opportunities and threats. After discussions with the lead writer of the new strategic business plan and getting approval, I took the action upon myself and created the Kennedy Space Center SWOT Analysis as shown below.

Kennedy Space Center Spaceport SWOT Analysis	
KENNEDY SPACE CENTER	Strengths <ul style="list-style-type: none"> - Brand/ Reputation - Prime Space Launch Location - Existing Facilities and Equipment - Experienced and Knowledgeable Workforce - Commercial Operated Runway - Ground Support Operations - Commercial Crew Program - 3 Mile Long Runway - Strong Transportation Corridor (Quinti-modal) - Secure Boundaries - Environmental Siting
	Weaknesses <ul style="list-style-type: none"> - Government Policies, Processes, and Culture - Cost to Modernize and Maintain Infrastructure - Required Security - Wildlife Refuge Policies - International Cooperation - Export Control
INDUSTRY	Opportunities <ul style="list-style-type: none"> - Launch Site and Flight Testing - Government/Commercial Partnerships - ISS National Lab - Suborbital Market - Point-to-Point Transportation - Satellite and Payload Processing - Space-Based Solar Power - Research and Development - Tourism Concession Operations - Space Debris Monitoring - Industry and University Efforts - Coordinate industry Activities (Workshops, Internships, etc.)
	Threats <ul style="list-style-type: none"> - Increasing Competition/ Industrial Base Capability - Difficulty of Leadership Consensus - Project Abandonment - ITAR - Dwindling Human Capital in the Market - Lack of Commoditization - Lack of Vehicle Reusability

This SWOT Analysis shows how strong KSC is as a spaceport at the industry level. Thanks to the experience from the Shuttle Program, Kennedy has a workforce, facilities and equipment that is hard to match. The position of KSC is a prime location due to the relative closeness to the equator. This specific location allows vehicle launching to take advantage of the Earth's spin, leading to less thrust and energy needed to reach orbit, and allows the vehicle to have a larger payload. Another major benefit or strength of KSC has is its environmental siting. If someone wanted to build something similar to Kennedy Space Center, it would be extremely difficult to get the environmental siting passed because the development of this area would have such a great impact on the wildlife, air quality, and other environmental issues.

Where the SWOT Analysis for KSC focuses on the specific center and industry, I thought it would also be beneficial to compare KSC against a purely commercial spaceport, Mojave Air and Space Port. This gives the opportunity to see the government influence here at Kennedy, along with how realistic operations would work at the center level. With the assistance of the negotiation team, I reached out to Stuart Witt the CEO and General Manager at Mojave and was asked him about his operations and the requirements that are imposed on the tenants.

The results of the conversation showed that only 14% of the operations at Mojave Air and Space Port fall under the spaceport side of operations with one licensed launch in nine years. On the other hand, Cape Canaveral averages between 12-16 launches a year. One major

operation at Mojave Air and Space Port is the rail transportation for its customers. The operation is one of the most lucrative parts of the business. Here in Florida, Kennedy Space Center is considered a quinti-modal transportation hub. A customer would have access to five different forms of transportation, air, water, rail, road, and space. This knowledge is beneficial to the negotiation team as it allows for a better understanding of the operations that will occur here at Kennedy. It also gives the team a better idea of what a customer would want from a spaceport in comparison to what KSC has to offer.

As prep work for negotiations over the SLF continued, I became entrusted with the duty of maintaining the Responsibility Matrix as it is a fluctuating document. This document allows the viewer to have an overall look at which organization will be responsible for certain aspects of the SLF once it is transitioned over to Space Florida. This is useful during the SLF Agreement negotiations as it allows each organization an overview of what the agreement states will be their responsibility or what is under their authority once the agreement is complete. This chart shows that NASA will still have an influence in the operations at the SLF. We will also be working with Space Florida to integrate operations happening at the SLF as well as other parts of KSC. NASA will also monitor safety and operations in a non-invasive manner.

From my experiences and all that I have learned during my internship, I believe Kennedy Space Center has great potential moving forward with all the facilities. From the remnants of the Shuttle Program, a great multi-user spaceport can form. As seen through my involvements throughout my internship, commercial partners coming to Kennedy will have access to unique opportunities, equipment, facilities, and an experienced workforce. As can be seen with the SLF agreement, There will be struggles as a balance is found between federal standards and commercial exploration. There is a learning curve as NASA begins to be more hands off and supportive of the commercial ideas that will be created here at Kennedy. NASA is making great strides in becoming a balanced home where government and commercial aerospace ideas can be fostered and grow.